

# **DRAFT ENVIRONMENTAL ASSESSMENT**

For

**The Bioenergy Program**

**FY 03-06**

As directed by the  
2002 Farm Security and Rural Investment Act

**FARM SERVICE AGENCY**

**UNITED STATES DEPARTMENT OF AGRICULTURE**



## Cover Sheet

<b>Mandated Action:</b>	The United States Department of Agriculture, Farm Service Agency (FSA), has been directed by the Congress of the United States to implement the Bioenergy Program Fiscal Years 2003 through 2006 to expand industrial consumption of agricultural commodities by promoting their use in the production of bioenergy (i.e., ethanol and biodiesel). This Bioenergy Program FY 03-06 will be implemented in the United States and its territories, as directed by Section 9010 of the Farm Security and Rural Investment Act of 2002.
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This Environmental Assessment was prepared in accordance with the United States Department of Agriculture FSA National Environmental Policy Act Implementation Procedures found in 7 CFR 799.4, as well as the National Environmental Policy Act of 1969, Public Law 91-190, 42 U.S.C. 4321-4347, 1 January 1970, as amended.

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## Chapter 1.0 Purpose of and Need for Action

### 1.1 Introduction

#### 1.1.1 Overview of the Farm Service Agency's Implementation of the Bioenergy Program

The Congress of the United States, through passage of Section 9010 of the Farm Security and Rural Investment Act of 2002 (2002 Act), provides statutory authority to direct the United States Department of Agriculture (USDA), Farm Service Agency (FSA), to implement the Bioenergy Program for Fiscal Years 2003 through 2006.

The Bioenergy Program was initially started under authority of the Commodity Credit Corporation (CCC) Charter Act to use its general powers to "increase domestic consumption of agricultural commodities by expanding or aiding in the expansion of domestic markets for agricultural commodities."

The objective of the Bioenergy Program is to expand industrial consumption of agricultural commodities by promoting their use in production of bioenergy (ethanol and biodiesel). Eligible feedstocks are expanded to include cottonseed, animal byproducts and fat, oils, and greases (including recycled fats, oils, and greases). CCC will make cash payments, up to \$150 million each fiscal year (FY 03-06), to bioenergy producers compensating them for a portion of their increased commodity purchases made to expand existing production of bioenergy and to encourage the construction of new production capacity. Program incentives are to repay bioenergy producers at a ratio of 1 feedstock reimbursed for every 2.5 feedstocks used (for producers with under 65,000,000 gallons total annual production capacity), or 1 feedstock reimbursed for every 3.5 feedstocks used (for producers with over 65,000,000 gallons total annual production capacity).

The Bioenergy Program FY 03-06 is part of the USDA's and Department of Energy's research activities and demonstration projects to address new opportunities of biomass production, biobased products, and bioenergy production.

Great interest exists in promoting biobased fuels because they are renewable and promote United States energy security. Biobased fuels provide a boost to agricultural commodity producers by expanding markets and increasing prices.

### 1.1.2 Purpose of Using an Environmental Assessment to Analyze this Action

FSA is preparing this Environmental Assessment (EA) to address the implementation of the Bioenergy Program to comply with the National Environmental Policy Act (NEPA), Council on Environmental Quality Regulations (CEQ), and 7 CFR 799.4: Environmental Quality and Related Environmental Concerns—Compliance with the National Environmental Policy Act.

## 1.2 Purpose of the Proposed Action

The purpose of this proposed action is to expand industrial consumption of agricultural commodities by promoting their use in the production of bioenergy (i.e., ethanol and biodiesel). Ethanol (ethyl alcohol) is made from the fermentation and distillation of simple sugars. Its biggest use in the U.S. is as an additive to gasoline to reduce the generation of carbon monoxide and ozone during gasoline combustion. Currently, about 1 billion gallons of ethanol are produced annually in the United States, with approximately 90 percent derived from fermentation of cornstarch.

Ethanol production has expanded dramatically in recent years in response to a number of factors, including clean air policies, Federal and State incentives, and higher petroleum prices that make ethanol more competitive for blending. One of the most critical factors underlying the ethanol industry's current growth is the planned ban on the use of methyl tertiary butyl ether (MTBE) in California and 17 other States because of groundwater pollution. MTBE is a fuel oxygenate that is blended with gasoline to replace lead and to increase octane. This ban will enlarge the market for ethanol and has already sparked a major expansion of ethanol production capacity from both new and existing plants. According to the Renewable Fuels Association, 12 ethanol plants are now under construction. When completed, they will raise total U.S. capacity to 2.8 billion gallons, up from 1.8 billion in 2000.

Biodiesel is made from natural, renewable vegetable oils (e.g., soybeans, cottonseeds, peanuts, sunflower seeds, canola) and animal byproducts (e.g., oils, fats, grease). Burning petroleum-based diesel blended with 20 percent biodiesel reduces particulates by 30 percent, unburned hydrocarbons by 47 percent, and carbon monoxide by 21 percent.

Biodiesel production remains limited, primarily to experimental and test-fleet applications. Unlike ethanol, no mandate exists to drive large-scale use and it is not yet cost competitive. Demand for biodiesel as a lubricity agent in diesel fuel could increase significantly, however, by 2007 when diesel fuel will be required to reduce sulfur content. As biodiesel production expands and the range of feedstock widens, costs should

#### The Purpose of an Environmental Assessment (EA)

An EA is a study conducted by a Federal agency to determine whether an action the agency is proposing to take would significantly affect any portion of the human or natural environment. The intent of the EA is to provide project planners and Federal decision-makers with relevant information on a Proposed Action's impacts on the environment.

If the EA finds that no significant impacts would result from the action, the agency can publish a Finding of No Significant Impact (FONSI), and can proceed with the action. If the EA finds that significant impacts would result from the action, then the agency must prepare and publish a detailed Environmental Impact Statement (EIS) to help it decide about proceeding with the action.

**Ethanol** is an alcohol-based fuel produced by fermenting sugars from crop starches.

**Biodiesel** is a clean-burning alternative fuel that can be made from materials such as vegetable oils, animal fats, and spent cooking greases.

start to decline. Production increases could also start to spur development of the infrastructure to transport and handle biodiesel inputs and products.

The Bioenergy Program is not expected to have appreciable impact on total ethanol production, which is already large and expanding rapidly. Ethanol is expanding rapidly on its own, and will not necessarily move faster due to the implementation of this Program. However, this Bioenergy Program provides support for individual firms, thus facilitating the increase in capacity.

For biodiesel, which is at an earlier stage of development, the Bioenergy Program's impact could be greater. The Office of Energy Policy and New Uses (OEPNU), located in the Office of the Chief Economist for the USDA, estimated total biodiesel production was 1-2 million gallons per year prior to implementation of the Bioenergy Program. OEPNU estimated 2001 production climbed to 10 million gallons, mainly in response to Bioenergy Program incentives. Biodiesel producers received bioenergy payments on 8.6 million gallons in 2001.

### **1.3 Need for Implementation of the Bioenergy Program**

Congress directed, through passage of the 2002 Act, that this Bioenergy Program continue from 2003 to 2006 for several reasons:

- The United States' continuing dependency on foreign crude-oil supplies
- The non-competitive status of our bioenergy products in existing national and energy markets
- The desire to expand national and agricultural commodity markets for United States' farmers
- The present lack of commodity markets for certain farm and forest-waste products

### **1.4 Objectives of the Bioenergy Program FY 03-06**

The following objectives, if reached to an acceptable degree, would move the United States meaningfully toward the desired future condition of increased bioenergy production and use.

- 1.4.1 Objective #1:** To expand cost-competitive bioenergy (specifically fuel-grade ethanol and biodiesel) production capacity in the United States.
- 1.4.2 Objective #2:** To reduce the United States' dependence on foreign oil.
- 1.4.3 Objective #3:** To expand agricultural markets.
- 1.4.4 Objective #4:** To improve air quality and atmospheric conditions.



## 1.5 Related NEPA and Other Legal Documents

- **Bioenergy Program FY 01-02 Environmental Assessment/FONSI**

This Environmental Assessment reported the analysis of the potential effects of implementing the Bioenergy Program FY 01-02 and concluded with a FONSI, stating that the Bioenergy Program FY 01-02 would not significantly affect the quality of the human environment.

- **Farm Security and Rural Investment Act of 2002, Section 9010**

Section 9010, Continuation of the Bioenergy Program, extends and amends 7 CFR Part 1424 Bioenergy Program into 2003 to 2006. It explains how and to whom payments may be made.

- **Bioenergy Program, 7 CFR Part 1424**

Part 1424 sets forth the basic terms and conditions a bioenergy producer must meet to obtain payments from the USDA CCC. Form CCC – 850, Bioenergy Program Agreement, contains specific payment terms and conditions.

## 1.6 Required Decisions

The Congress of the United States directed FSA through the 2002 Act to implement the Bioenergy Program FY 03-06. The decision of whether or not to implement the Bioenergy Program FY 03-06 has been **foreclosed** by the passage of this law.

The primary decision FSA must make is to promulgate FSA regulations, program policies, and procedures in administering the CCC operation of the Bioenergy Program. In turn, the CCC would decide which agreements are eligible, what Bioenergy payments are approved, and, if available funding is insufficient to cover all payments, what payment factor is needed to ensure payments are made equitably to all producers.

## 1.7 Scope and Relevant Environmental Issues

### 1.7.1 Scoping

The FSA Analysis Team used a systematic, interdisciplinary approach, with appropriate public involvement, to identify the need for and to develop the objectives of this Congressionally-mandated Bioenergy Program. The Analysis Team ensures that the Bioenergy Program FY 03-06 will comply with Section 9010 of the 2002 Act and other applicable laws and regulations.

The Bioenergy Program FY 03-06's enabling legislation authorizes implementation in all 50 States and its territories. Thus, this environmental analysis covered the meaningful effects that will result from FSA's authorizing CCC to make payments to bioenergy producers in all 50 States and its territories.

The environmental analysis covered the effects of continued production of bioenergy (i.e., ethanol and biodiesel) at the 57 ethanol and 19 biodiesel conversion plants. These are the same plants that produced bioenergy in the previous Bioenergy Program FY 2001–2002.

This analysis also included the effects of including two commodities **not already** covered by other USDA crop-subsidy programs. The commodities that are **already covered** by other NEPA-compliant crop-subsidy programs are outside the scope of this environmental analysis (see CEQ Regulations § 1501.7(c)). The two new commodities are:

- Cottonseed
- Animal by-products

The Analysis Team contacted many Federal, State, and county agencies for information and advice on implementing this Program, including the following:

- Agricultural Marketing Service (AMS)
- Animal and Plant Health Inspection Service (APHIS)
- National Resource Conservation Service (NRCS)
- Rural Utility Service (RUS)
- Agricultural Research Service (ARS)
- Cooperative State Research, Education, & Extension Service (CSREES)
- Department of Energy (DOE)
- Environmental Protection Agency (EPA)
- Department of the Interior (DOI)
- Federal Energy Regulatory Commission (FERC)

The Analysis Team also gathered knowledge and used experience gained during implementation and administration of the 2001 to 2002 Bioenergy Program to refine the design and to predict the consequences of the Bioenergy Program FY 03-06 on the quality of the human environment.

As part of this analysis, the FSA Analysis Team identified four objectives (see Section 1.4) and three environmental **issues** (see Section 1.7.1) that might be meaningfully affected during implementation of the Bioenergy Program FY 03-06.

### 1.7.2 Relevant Environmental Issues

The following environmental issues might be meaningfully affected by the implementation of the Bioenergy Program FY 03-06:

- Issue #1. Impacts on energy supply
- Issue #2. Impacts on air quality and atmosphere

Issue #3. Impacts on social and economic conditions

### 1.7.3 Environmental Issues with Minor Impact

Per the CEQ Regulations § 1500.4(c), the following potential issues were carefully studied and then dismissed because they were deemed to be only slightly impacted by this action. The previous *Bioenergy Program FY 01-02 Environmental Assessment* reported the analysis of the potential effects of implementing the Bioenergy Program FY 01-02 and concluded with a FONSI, stating that the FY 01-02 Bioenergy Program would not significantly affect the quality of the human environment. Based on this previous analysis and on the current analysis, the FSA Analysis Team's concluded that the following issues would not be meaningfully affected by implementing Bioenergy Program FY 03-06.

- Wetlands
- Threatened/Endangered Species
- Wild or Scenic River
- Water Quality
- Noise
- Land Cover
- Prime Range Land
- Fish Production
- Natural Streams
- Floodplains
- Wilderness
- Natural Landmark
- Water Quantity
- Radiation
- Soil Erosion
- Prime Forest Land
- Timber Production
- Population Migration
- Sole Source Aquifers
- Coastal Barrier Resources Systems
- Historic/Archeological
- Odor
- Pesticides/Fertilizers
- Important Farmland
- Wildlife Habitat
- Recreation

The Bioenergy Program encourages the production of more bioenergy resulting in the burning of less fossil fuel. This would decrease emissions that contribute to acid rain. This will have a positive affect on all resources listed above. Also, the program encourages farmers to keep producing crops that can be converted for bioenergy which would mean more agricultural lands would stay in agricultural use. This would benefit highly erodible and land cover issues by keeping crops growing on soils and help with wildlife habitat and threatened and endangered species by supplying cover and food.

## 1.8 Federal Laws, Permits, and Agreements Needed to Implement the Bioenergy Program FY 03-06

FSA would promulgate program regulations, policies, and procedures to implement the proposed action. These will require all eligible producers “. . . meet all other requirements of Federal law (including regulations) applicable to the production of bioenergy.” Table 1.1 shows a list of potential laws and the applicable permits, agreements, and reports required to implement the Bioenergy Program.

**Table 1.1 List of Laws and Applicable Permits, Agreements, and Reports Required to Implement the Bioenergy Program.**

Laws and Agencies	Compliance, Permits, Agreements, Reports
Section 9010, Continuation of the Bioenergy Program, Farm Security and Rural Investment Act of 2002	Compliance with Section 9010 extends and amends 7 CFR Part 1424 Bioenergy Program into 2003 to 2006, stating that the funding must be no more than \$150 million for each Fiscal Year. It explains how and to whom payments may be made.
7 CFR Part 1424, Bioenergy Program, and the Proposed Rule for implementing this Program	Compliance with Part 1424 establishes the Bioenergy Program and sets forth the basic terms and conditions a bioenergy producer must meet to obtain payments from the USDA CCC for eligible bioenergy production. Form CCC – 850, Bioenergy Program Agreement, contains additional terms and conditions.
Farm Service Agency (FSA)	Permits, authorizations, and reporting as required.
Commodity Credit Corporation (CCC)	Agreement, inspections, and reporting as required.
Applicable Environmental Laws (i.e., Clean Air Act, Clean Water Act, and the Endangered Species Act)	Eligible producers must comply with Federal laws.

## Chapter 2.0 Alternatives Including the Proposed Action

### 2.1 Introduction

Chapter 2 describes the activities that **would not occur** if Alternative A: Do Not Implement the Bioenergy Program FY 03-06 Bioenergy Program (No Program) were implemented. It describes the activities that **would occur** if Alternative B: Implement the Bioenergy Program FY 03-06 was implemented.

Then this chapter presents a summary comparison of the predicted attainment/non-attainment of the project objectives and the predicted effects of both Alternative A (No Program) and Alternative B (Program) on the quality of the human environment, **providing a clear basis for choice among the options for the decisionmaker and the public**. The CEQ Regulations § 1502.14 refers to this summary comparison as the *heart* of this Environmental Assessment.

Finally, this chapter identifies the FSA's Preferred Alternative.

### 2.2 History and Process Used to Formulate the Alternatives

The FSA Analysis Team used a systematic, interdisciplinary approach with appropriate public involvement to ensure that the design of the proposed action complies with Section 9010 of the Farm Security and Rural Development Act of 2002.

Congress in Section 9010 established the broad outlines of the Proposed Action. In particular, Section 8010 is the source for the objectives listed above in Section 1.4. These objectives are the basis for the Proposed Action (Alternative B) as described below in Section 2.5.2.

The congressional mandate, as expressed in Section 9010 means that the range of reasonable alternatives analyzed in this EA is severely limited. Section 2.4 below explains that the FSA Analysis Team developed and discussed a Reduced Program Alternative. This alternative failed to meet Section 9010 requirements, as evidenced by its failure to meet three of the project objectives as listed in Section 1.4. This failure to meet the objectives means that it would not be a legal alternative, thus not implementable.

Congressional development of the Farm Security and Rural Development Act of 2002 also provided opportunities for the public to express their opinions and preferences as to the details of farm policy included in the bill, including ideas as to the proper role of bioenergy.

This public involvement (from congressional hearings) and agency discussions lead to the details included in Alternative B: Implement the Bioenergy Program FY 03-06.

Based on the preceding analysis steps, the EA Analysis Team considers the two alternatives analyzed in this EA to represent a range of reasonable alternatives (one legal test of full NEPA compliance).

A meeting was held between FSA and U.S. Fish and Wildlife Service, Division of Endangered Species, on July 19, 2002, to discuss compliance with section 7 of the Endangered Species Act (ESA) of 1973. Informal consultation was initiated at this time.

## 2.3 Alternative Design and Selection Criteria

The FSA Analysis Team used the following criteria to design Alternative B: Implement the Bioenergy Program FY 03-06. Later, the FSA Decisionmaker will use these criteria to select an alternative to implement.

### 2.3.1 Policy, Financial, Administrative, and Technical Design Requirements

- Compliance with Section 9010 of the Farm Security and Rural Development Act of 2002

### 2.3.2 Management-Directed Outcome Requirements (Objectives)

- Develop and expand cost-competitive bioenergy (specifically fuel-grade ethanol and biodiesel) production by U.S. and producers.
- Reduce U.S. dependence on foreign oil.
- Expand agricultural markets.

### 2.3.3 Mandatory Environmental Requirements

- Stipulations mandated by the U.S. Fish and Wildlife Service under Section 7 of the ESA of 1973
- Compliance with the Fish and Wildlife Coordination Act of 1934

## 2.4 Alternatives Considered But Eliminated from Further Study

The FSA Analysis Team developed a **Reduced Program Alternative**. However, the Analysis Team determined that this alternative would not comply fully with the congressionally mandated enabling legislation—it would not fulfill the need; it would not meet the three project objectives. Thus, the Analysis Team eliminated this alternative from further consideration (see CEQ Regulations § 1500.2, Policy (b)).

## 2.5 Description of Alternatives Considered

### 2.5.1 Alternative A: Do Not Implement the Bioenergy Program (No Program)

If Alternative A (No Program) were implemented, the following events would **not** occur:

- Bioenergy producers would not apply nor sign new contractual agreements to CCC to participate in the Bioenergy Program FY 03-06.
- Probably none of the 14 current biodiesel producers in the 2001 to 2002 Bioenergy Program would increase purchase and use of agricultural commodities for increased production of bioenergy. Ethanol would increase but not biodiesel.

- CCC would **not** make cash payments to bioenergy producers compensating them for a portion of their increased commodity purchases during 2003, 2004, 2005, and 2006.

**Special Note:** Alternative A (No Program) would **not** comply with Section 9010, Farm and Security and Rural Investment Act as mandated by the Congress of the United States. Thus, Alternative A is **not** a legally viable choice for the FSA decisionmaker. However, the Analysis Team has kept Alternative A in the analysis and in this document for a legal reason and a scientific reason:

1. To comply with the CEQ Regulations 1502.14(d), which requires a serious consideration of the No Program Alternative.
2. To serve as an essential part of the **analysis baseline** against which the effects of Alternative B: Implement the Bioenergy Program FY 03-06 can be compared.

### 2.5.2 Alternative B: Implement the Bioenergy Program FY 03-06

When Alternative B is implemented, as required by law, the following **will** occur:

- Bioenergy producers will apply to CCC to participate in the Bioenergy Program FY 03-06.
- Most, if not all, of the 60 current producers probably will sign new contractual agreements with CCC to continue and/or to increase bioenergy production.
- Some unknown number of new producers of bioenergy probably will sign contractual agreements with CCC to produce bioenergy.
- Producers will provide CCC with evidence of increased purchase and use of agricultural commodities for increased production of bioenergy.
- CCC will make cash payments to bioenergy producers compensating them for a portion of their increased commodity purchases.
- CCC will make up to \$150 million in cash payments per year during 2003, 2004, 2005, and 2006 based on the increase in bioenergy production compared to the previous year's production fiscal year to date.

The tables under Section 2.6 and 2.7 are the **heart** of the Environmental Assessment. They present the activities, achievement/non-achievement of the project objectives, and the predicted environmental effects in comparative form. As required by CEQ Regulations § 1502.14, these matrices provide a **clear basis for choice** between Alternative A and Alternative B for the public and the FSA decisionmaker.

## 2.6 Summary Comparison of Attainment of Program Objectives

Table 2.1 provides a summary of the objectives and how the alternatives meet those objectives.

**Table 2.1 Summary Comparison of Predicted Achievement of Project Objectives**

<b>Objectives of Bioenergy Program FY 03-06</b>	<b>Alternative A: Do Not Implement the Bioenergy Program FY 03-06 (No Program)</b>	<b>Alternative B: Implement the Bioenergy Program FY 03-06</b>
<b>Objective #1:</b> To expand cost-competitive bioenergy (specifically fuel-grade ethanol and biodiesel) production capacity in the United States.	If Alternative A were implemented, <b>no</b> bioenergy fuel produced would receive benefits under this Bioenergy Program FY 03-06. However, some unknown number of gallons of bioenergy fuels would be produced by private entities, but little or no development or expansion of cost-competitive fuel-grade ethanol and biodiesel would occur. This number of gallons probably would hold steady at the FY 2000, but it might increase slightly.	If Alternative B were implemented, development expansion of cost-competitive fuel-grade ethanol and biodiesel, during FYs 2003 to 2006 would occur. The 147.7 gallons of ethanol would steadily increase and reach at least 200 million gallons and possibly be as high as 300 million gallons per year by 2006.
<b>Objective #2:</b> To reduce the use of fossil fuels and the United States' dependence on foreign oil.	If Alternative A were implemented, U.S. dependency on foreign oil from 2003 to 2006 would remain essentially the same, importing between 10 and 12 million barrels of oil a day.	If Alternative B were implemented, approximately 250 million gallons of ethanol would be produced annually, helping in a minor way to reduce our dependence on foreign oil.
<b>Objective #3:</b> To expand agricultural markets	If Alternative A were implemented, national agricultural markets for sources of ethanol would gradually increase as ethanol production expands. This market expansion would be less than under Alternative B.	If Alternative B were implemented, national agricultural markets for sources of ethanol would more rapidly increase as existing and new producers expand their production of ethanol. This increase would ultimately affect both national and international markets in bioenergy commodities and biomass crops.
<b>Objective #4:</b> To improve air quality and atmospheric conditions	Air quality would remain the same or possibly degrade in some areas.  Atmospheric conditions would remain the same or possibly degrade in some areas.	Air quality would be improved with the use of bioenergy.  Atmospheric conditions would be improved with the use of bioenergy.



## 2.7 Summary Comparison of Predicted Resource Effects

Chapter 3 analyzes the existing environment and the environmental effects of implementing Alternative A—No Action or Alternative B—Implement Bioenergy Program. The comparison of environmental effects between the alternatives for each environmental issue is summarized in Table 2.2.

**Table 2.2 Comparative Matrix of Alternatives and Effects.** Table summarizes the environmental effects of alternatives.

Relevant Environmental Issues	Predicted Effects of Implementing Alternative A: Do Not Implement the Bioenergy Program FY 03-06 (No Program)	Predicted Effects of Implementing Alternative B: Implement the Bioenergy Program FY 03-06
<b>Issue #1: Energy Supply</b>	U.S. still required to rely on imported oil to produce the fuels that power the U.S., including farms.	Alternative B would enhance the U.S.' energy security. Bioenergy fuels could replace half or more of the nation's year 2000 gasoline consumption. Up to \$25 billion spent on foreign oil could be used within the U.S. economy.
<b>Issue #2: Air Quality and Atmosphere</b>	Not increasing the use of bioenergy in the U.S. would require the continued use of the same levels or higher of fossil fuels, which would continue to degrade air quality.	The increased production of bioenergy would somewhat offset the use of fossil fuels in the U.S. and assist with improving air quality or at least prevent further degradation. May reduce the impact of greenhouse gases.
<b>Issue #3: Social and Economic Conditions</b>	The current output of crops and payments to producers will not appreciably increase or decrease.	Due to the Bioenergy Program's FY 03-06 financial assistance, approximately the same number of farmers will grow eligible crops and approximately the same number of producers from as many or more States will sign contractual agreements with the CCC for payments to transform eligible commodities into bioenergy.  Money previously spent for oil imports will be spent in rural America, generating jobs in the agricultural and production sectors. Rural communities would grow due to placement of conversion and production facilities close to the crops necessary for producing bioenergy. Up to 17,000 jobs could be created for every billion gallons of ethanol produced.

## 2.8 Identification of FSA's Preferred Alternative

Alternative B: Implement the Bioenergy Program FY 03-06 is FSA's the **Preferred Alternative** as mandated by the Congress of the United States under Section 9010 of the Farm and Security and Rural Investment Act.



## Chapter 3.0 Baseline and Environmental Effects of Alternatives

### 3.1 Introduction

Chapter 3 forms the **scientific and analytic basis** for the summary comparison of effects presented in Chapter 2. It (1) presents ethanol and biodiesel baselines and the forecasted production quantities, (2) presents the predicted attainment/non-attainment of the project objectives, (3) succinctly describes the environmental issues, and (4) presents the predicted effects of the alternatives on these issues.

The affected environment throughout this chapter is generally described and discussed in terms of the 24 states where commodity crops are grown and processed for bioenergy use by current bioenergy program participants. The bioenergy producing states are: Arizona, California, Florida, Iowa, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Minnesota, Missouri, Montana, North Carolina, North Dakota, Nebraska, New Mexico, Nevada, Ohio, Oregon, South Dakota, Tennessee, Texas, and Wyoming.

#### 3.1.1 Assumptions Used in Analysis

The analysis in this EA uses the following assumptions:

- Changes in ethanol and biodiesel production translate to no net change in acres used for farming.
- The existing baseline is not drawn from pristine land; rather, from existing crop land.
- CCC payments to bioenergy producers will mostly be used to increase production from existing facilities, not for new construction.

Farmers are unlikely to increase their total production acreage (e.g., add unfarmed land to their current farm land) because of acquisition costs of new land, water rights, distance to production facilities, cost of transportation and/or new equipment, and other potential restrictions. The most likely conversion to happen is the replacement of one commodity crop with another on existing land. If one crop is not making more money than another, by comparison, the farmer typically will switch from farming the less profitable crop to the more profitable crop. Therefore, the assumption is that very little new (previously unfarmed) land will be added because of this program, and that increases in production will come from switching commodity crops within existing farmland acreage.

### 3.2 Description of Issues and Predicted Effects on Relevant Affected Resources of Alternative A and Alternative B

#### 3.2.1 Issue #1: Energy Supply

##### 3.2.1.1 Baseline for Issue #1

The need to reduce dependence on foreign oil sources was identified as an objective of the bioenergy program. Today, the U.S. imports 11 barrels of oil for every 10 barrels produced domestically. This strong

dependence on imported oil for petroleum fuels has a negative economic impact on the U.S. trade balance, and also leaves the U.S. exposed to potential instabilities in supply (NBPBCO, 2001).

Table 5 of the *Short-Term Energy Outlook – September 2002* put out by the Department of Energy, Energy Information Administration, shows that at the end of 2001, total petroleum net imports were 10.33 million barrels per day. In 2003, the imports are predicted to increase to 11.10 million barrels per day. Table 4 of the same report shows that at the end of 2001, the average cost per barrel of imported oil was \$22.01. Predictions through 2003 show an increase to \$26.91 (see <http://www.eia.doe.gov/emeu/steo/pub/contents.html> for the full report).

According to Argonne National Laboratory, with current technology the use of E10 blended gasoline (10 percent ethanol/90 percent gasoline) leads to a 3 percent reduction in fossil energy use per vehicle mile, while the use of E95 (95 percent ethanol/5 percent gasoline) could lead to a 44 percent reduction in fossil energy use (Wang, et al, 2000).

The amount of fossil energy estimated to be saved by the use of ethanol must be considered in the context of the energy expended to produce the ethanol fuel product. Some studies have suggested that the amount of energy required to produce ethanol is roughly equal to the amount of energy obtained from its combustion. This would result in little or no reductions in fossil energy use (Kofvski, 1998). If the energy used to produce ethanol is petroleum based, ethanol would do little to enhance energy security. Fuel ethanol only displaces approximately 1.2% of gasoline consumption in the United States. This small market share has led to the Government Accounting Office (GAO) to conclude that the ethanol tax incentive has done little to enhance energy security (GAO, 1997). In addition, since ethanol is dependent on the U.S. corn supply, any threats to this supply (i.e., drought), or increases in corn prices would have a negative effect on the supply of ethanol. In fact, this occurred in 1995 when high export demand resulted in increased corn prices and contributed to an 18 percent decline in ethanol production between 1995 and 1996 (Yacobucci and Womach, 2000).

### ***3.2.1.2 Predicted Effects of Alternative A and Alternative B on Energy Supply***

#### ***Alternative A—No Action***

Not increasing the production of bioenergy would require the U.S. to continue to rely on imported oil to produce the fuels that power the U.S., including farms.

#### ***Alternative B***

The increased production of bioenergy would enhance the U.S.' energy security. With sustainable agricultural practices, bioenergy fuels could replace half or more of the Nation's entire current level of gasoline consumption. That would keep upwards of \$25 billion a year working at home that we now send abroad for imported oil (ABA website, 2000).

It would also allow energy producers and consumers to have a renewable energy option with uniquely desirable characteristics. Bioenergy has the greatest potential of any renewable energy option for baseload electric power production. It is also the renewable resource with the most promise for producing economically competitive liquid transportation fuels. Co-production facilities will allow the production of

electricity when it is needed and ethanol when it is not—acting, in effect, as “seasonal peaking” facilities (ABA website, 2000).

### 3.2.2 Issue #2: Air Quality and Atmosphere

#### 3.2.2.1 Baseline for Issue #2

##### *Ethanol*

One of the main motivations for ethanol use is improved air quality. Ethanol is primarily used in gasoline to meet minimum oxygenate requirements of two Clean Air Act programs. Reformulated gasoline (RFG) is used to reduce vehicle emissions in areas that are in severe or extreme nonattainment of the National Ambient Air Quality Standards (NAAQS) for ground level ozone. There are ten metropolitan areas covered by this requirement, and there are many others with less severe ozone problems that have opted into the program as well (EPA, 2002):

##### *Required Areas*

- California
  - Los Angeles
    - South Coast Air Basin
    - South East Desert
    - Ventura
  - San Diego County
  - Sacramento
- New York
  - New York
    - Northern New Jersey
    - Long Island
- Illinois
  - Chicago
    - Gary
    - Lake County
- Texas
  - Houston
    - Galveston
    - Brazoria
- Connecticut
  - Hartford
    - New Haven
    - Waterbury
- Pennsylvania
  - Philadelphia
    - Wilmington
    - Trenton
    - Cecil County
- Maryland
  - Baltimore
- Wisconsin
  - Milwaukee
    - Racine

##### *“Opt-In” Areas*

- Connecticut
  - Entire state
- District of Columbia
  - Entire district
- Maryland
- Delaware
  - Entire state
- Kentucky
  - Cincinnati-Hamilton
  - Louisville
- Massachusetts

- Washington, DC-MD-VA area
- Kent & Queen Anne's
- Missouri
  - St. Louis
- New Jersey
  - Entire state
- Rhode Island
  - Entire state
- Virginia
  - Washington DC-MD-VA
  - Richmond
  - Norfolk-Virginia Beach-Newport News
- Entire state
- New Hampshire
  - Boston-Lawrence-Worcester
- New York
  - Essex
- Texas
  - Dallas-Fort Worth

In these areas, RFG is used year-round. By contrast, the Oxygenated Fuels program operates in the winter months in 18 areas that are listed as carbon monoxide (CO) nonattainment areas (U.S. EPA, 2001):

- El Paso, TX
- Missoula, MT
- Phoenix, AZ
- Klamath county, OR
- Anchorage, AK
- Portland, OR
- Denver/Boulder, CO
- Provo/Orem, UT
- Los Angeles, CA
- Medford, OR
- Spokane, AK
- Tucson, AZ
- Ft. Collins, CO
- Las Vegas, NV
- Reno, NV
- Fairbanks, AK
- Albuquerque, NM
- Grants Pass, OR

The U.S. Environmental Protection Agency (EPA) states that RFG has led to significant improvements in air quality, including a 17 percent reduction in volatile organic compounds (VOCs) emissions from vehicles, and a 30 percent reduction in toxic emissions.

Although oxygenates lead to fewer emissions of VOCs and COs, they may lead to higher emissions of nitrogen oxides (NOx). Since all three constituents contribute to the formation of ozone, the National Research Council recently concluded that while RFG certainly leads to improved air quality, the oxygenate requirements in RFG may have little overall impact on ozone formation (National Research Council, 1999).

Evidence indicates that the most widely used fuel oxygenate, methyl tertiary butyl ether (MTBE), contaminates groundwater. MTBE has been identified as an animal carcinogen, and it might be a human carcinogen as well. Efforts are underway in several States to ban the use of MTBE and obtain waivers for the requirements to use oxygenated fuel. California is planning to ban the use of MTBE in 2004.

If the oxygenate requirements were eliminated, some refiners claim that the environmental goals of the RFG program could be met through cleaner, although potentially more costly, gasoline that does not contain any oxygenates (Jessel, 1999). These claims indicate that the requirement to oxygenate gasoline might not be necessary.

Even though the potential ozone benefit from oxygenates in RFG has been questioned, almost no dispute exists that the winter Oxy-Fuels program has led to lower emissions of CO. The Oxy-Fuels program

requires oxygenated gasoline in the winter months to control CO pollution in NAAQS nonattainment areas for the CO standard.

The air-quality benefits from purer forms of ethanol can be substantial. Compared to gasoline, use of E85 and E95 (blended fuels of 85 percent ethanol/15 percent gasoline and 95 percent ethanol/5 percent gasoline, respectively) can result in a 30 to 50 percent reduction in ozone forming emissions. However, the use of more pure blends of ethanol also leads to increases in acetaldehyde, defined by the Clean Air Act as a toxic air pollutant. This contaminant, however, can be removed through the use of advanced catalytic converters.

### ***Biodiesel***

The use of biodiesel in conventional diesel engines results in significant reductions in unburned hydrocarbons, CO, and particulate matter. The production and use of biodiesel creates 78% less carbon dioxide emissions than conventional diesel fuel. Combustion of biodiesel additionally provides a 56% reduction in hydrocarbon emissions and yields significant reductions in carbon monoxide and soot particles compared to petroleum-based diesel fuel. Also, biodiesel can reduce the carcinogenic properties of diesel fuel by 94% (DOE, 2002).

### ***Global Warming***

Another potential benefit from ethanol and biodeisel use is that they are renewable fuels. Proponents of ethanol argue that it has the potential to reduce greenhouse gas emissions from automobiles relative to gasoline, therefore reducing the risk of possible global warming.

According to Argonne National Laboratory, using E10, vehicle greenhouse gas emissions (measured in grams per mile) are approximately 1% lower than with the same vehicle using gasoline. With improvements in production processes, by 2010, the reduction in greenhouse gas emissions from ethanol relative to gasoline could be as high as 8-10% for E10, while the use of E95 could lead to significantly higher reductions (Wang et al, 2000).

Biodiesel reduces greenhouse emissions up to 80 percent on a life-cycle basis (DOE). Biodiesel production can provide a new revenue system for farmers while meeting multiple environmental and energy goals.

However, other studies have called into question the efficiency of the ethanol production process (Kovski, 1998). These studies factor into the carbon budget the greenhouse gas emissions that result from the ethanol manufacturing process itself, which would diminish the net greenhouse gas reduction.

#### ***3.2.2.2 Predicted Effects of Alternative A and Alternative B on Air Quality and Atmosphere***

##### ***Alternative A—No Action***

Not increasing the use of bioenergy in the U.S. would continue to use the same levels or higher of fossil fuels, which would continue to degrade air quality.

##### ***Alternative B***

The increased production of bioenergy would somewhat offset the use of fossil fuels in the U.S. and assist with improving air quality or at least keep it from further degradation. Use of the bioenergy fuels will help to decrease greenhouse gas emissions.

### **3.2.3 Issue #3: Social and Economic Conditions**

#### **3.2.3.1 Baseline for Issue #3**

The Bioenergy Program provides cash payments to bioenergy (ethanol and biodiesel) producers who increase their bioenergy production from eligible commodities compared to the previous Fiscal Year. Eligible producers can receive up to \$7.5 million per year in payments. The Bioenergy Program offers producers from smaller plants more favorable payment rates, resulting in higher subsidy rates, to encourage their participation.

Expenditure payments to bioenergy producers of up to \$150 million were appropriated in Fiscal Years 2001 and 2002. In Fiscal Year 2002 the announced eligible commodity listing was expanded to include biodiesel production from animal fats and oils. Total program payments for Fiscal Year 2001 were \$40.7 million on 147.7 million gallons of increased bioenergy production. For the first three quarters of Fiscal Year 2002, total payments to bioenergy producers were \$47.5 million for 152 million gallons of increased production. The payment funds for 2003 to 2006 must not exceed \$150 million per year, approximately \$37.5 million per quarter.

As of 9 July 2002, approximately 61 (46-Ethanol; 15-Biodiesel) companies or corporations from 24 States have signed contractual agreements with the CCC for payments to transform biomass in bioenergy (i.e., produce ethanol and biodiesel from organic materials).

On 8 January 2002, the USDA reported the results of the Fiscal Year 2001 Bioenergy Program as an increase in output of 141.3 million gallons of ethanol and 6.4 million gallons of biodiesel, indicating additional usage of U.S. crops, especially corn and soybeans. Payments to producers for Fiscal Year 2001 were \$32.74 million for increased ethanol production and \$7.94 million for increased biodiesel production.

#### **3.2.3.2 Predicted Effects of Alternative A and Alternative B on Economic Conditions**

##### *Alternative A—No Action*

The current output of crops and payments to producers will not appreciably increase or decrease.

##### *Alternative B*

Because of the Bioenergy Program FY 03-06's financial assistance, the FSA Analysis Team assumes that approximately the same number of farmers will grow eligible crops and approximately the same number of producers from as many or more States will sign contractual agreements with the CCC for payments to transform eligible commodities into bioenergy as part of the Bioenergy Program FY 03-06.

Additional benefits from implementing the Bioenergy Program FY 03-06 is the continued shift of money spent for oil imports to rural America. This creates jobs in the agricultural sector as well as the production sector. Rural communities would grow because conversion or production facilities would most likely be located close to the crops necessary for the production of bioenergy. Farm income would rise and crop



prices should increase or at least remain stable. The USDA has estimated that 17,000 jobs are created for every billion gallons of ethanol produced (ABA, 2000).

### 3.2.4 Summary of Overall Environmental Impacts

The following environmental impacts are listed in Section 102(C) of the National Environmental Policy Act. They are mandatory topics for an Environmental Impact Statement, and they are important for this EA even though, as the following discussion shows, few if any of these impacts are of high relevance to decisions relating to bioenergy production.

**Unavoidable adverse impacts.** Few if any adverse effects will occur if Alternative B is implemented because most impacts would be beneficial. Of the four relevant issues listed and compared in Section 2.7, no adverse environmental impacts would occur at the overall program level. In some site-specific cases, individual producers of bioenergy might adversely impact the environment, but this is unlikely, given the range of substantive laws, such as the Clear Air Act and the Clean Water Act, that would prevent or mitigate possible adverse impacts.

**Short-term uses versus long-term productivity.** Short-term impacts would be generally beneficial, with increases in some agricultural products and associated increases in farm worker employment. These impacts (short-term uses or actions) have very little direct relation to questions about long-term productivity. Long-term productivity is only of interest if overall national dependence on fossil fuels is considered. Here, again, Alternative B would have a long-term beneficial impact, helping to lessen our national dependence on fossil fuels.

**Irreversible and Irretrievable Commitments of Resources.** As with the preceding two points, few irreversible and irretrievable commitments of resources would occur. Almost all agricultural products used to produce bioenergy products are sustainable in nature, that is, they are not one-time use products, such as oil from an underground reservoir or ore from a mine. The sustainable (replaceable) nature of bioenergy products shows that Alternative B is overwhelming beneficial in its impacts on resources.

## Chapter 4.0 List of Preparers

### 4.1 List of Preparers

**Table 4.1 List of Preparers.** Table identifies by name, education, and years experience those who contributed as part of the interdisciplinary team.

Name	Area of Expertise	Academic Degrees	Years of Experience
Sidney L. Jenson	Writer/Editor, NEPA Specialist	Ph.D., English	20 years
James P. Fortner	Environmental Compliance Manager	B.S., Agricultural and Extension Education	17 years
Don Steck	Environmental Protection Specialist	B.S. Soil Science	25 years
Kathleen Schamel	Federal Preservation Officer	B.A.; M.A., Anthropology	18 years

Mr. James Goff, Bioenergy Program Manager for Farm Service Agency, provided historical background and predictive information in support of this EA.

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## **Chapter 5.0 List of Agencies and Persons Consulted and/or Provided Copies of This Environmental Assessment**

- Natural Resources Conservation Service
- U.S. Fish and Wildlife Service

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## Appendix A: Acronyms, Abbreviations, and Terms

Term	Definition
Agreement	Bioenergy Program Agreement, Form CCC-850
Alternatives	Different ways of achieving the project objectives
ATF	Bureau of Alcohol, Tobacco and Firearms, at Department in the Treasury
Biobased product	As defined in Executive Order 13134, a commercial or industrial product (other than food or feed) that uses biological products or renewable domestic agricultural (plant, animal, and marine) or forestry materials.
Biodiesel	A nontoxic, biodegradable replacement for or additive to petroleum diesel derived from the oils and fats of plants and animals and manufactured in the United States or its territories. Chemically, biodiesel is described as a mono alkyl ester. And meets the ASHA's biodiesel standard.
Biodiesel producer	A company or corporation that produces and sells biodiesel who is also registered and in good standing with Environmental Protection Agency under Clean Air Act Amendment of 1990, Title II, Section 211(b).
Bioenergy	Specifically for this Bioenergy Program, commercial fuel grade ethanol and biodiesel produced from eligible commodities.
Biomass	Any organic matter that is available on a renewable or recurring basis (excluding old-growth timber), including dedicated energy crops and trees, agricultural food and feed crop residues, aquatic plants, wood and wood residues, animal wastes, and other waste materials that can be converted to bioenergy (ethanol and biodiesel).
CEQ Regulations	Regulations for Implementing the Procedural Provisions of NEPA, 40 CFR Parts 1500-1508, 1992
CFR	Code of Federal Regulations
CCC	Commodity Credit Corporation, United State Department of Agriculture
Eligible Commodities	Barley, corn, grain sorghum, oats, rice, wheat, soybeans, sunflower seed, canola, crambe, rapeseed, safflower, sesame seed, cotton seed, flaxseed, mustard seed, and cellulosic crops, such as switchgrass and short-rotation trees, or any other commodity or commodity by-product as determined and announced by CCC to be used in ethanol and biodiesel production that is produced in the United States and its territories.
Eligible producer	A bioenergy producer who has been determined by the CCC to be eligible to receive Program payments and has entered into an Agreement.
Environmental Assessment	Means a concise public document for which a Federal agency is responsible that serves to: <ul style="list-style-type: none"> <li>Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.</li> </ul>

<b>Term</b>	<b>Definition</b>
	<ul style="list-style-type: none"> <li>• Aid an agency's compliance with the Act when no environmental impact statement is necessary.</li> <li>• Facilitate preparation of a statement when one is necessary.</li> <li>• It shall include brief discussions of the need for the proposal, of alternatives as required by section 102(2)(E), of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.</li> </ul>
Programmatic Environmental Assessment	An environmental document that records an environmental analysis of a program. Subsequent site-specific documents tier to the programmatic document, concentrating on the relevant issues specific to a particular place, incorporating by reference the general discussions contained in the Programmatic Environmental Analysis. See CEQ Regulations § 1508.28 for a definition of tiering, § 1502.4(c) for general directions on preparing Programmatic Environmental Assessments.
Ethanol	Anhydrous ethyl alcohol manufactured in the United States or its territories and sold: (1) for fuel and which has been rendered unfit for beverage use and which is produced at a facility approved by the ATF for the production of ethanol for fuel, or (2) as denatured ethanol used by blenders and refiners which has been rendered unfit for beverage use.
Ethanol producer	A producer that has authority from the Alcohol, Tobacco, and Firearms Agency to produce ethanol.
FSA	FSA, part of United States Department of Agriculture
FY	Fiscal Year beginning each October 1 and ending September 30 of the following year
Human environment	As defined in the CEQ Regulations § 1502.14, the term human environment includes all relevant physical, biological, economic, and social factors.
Mitigation measures	Ways to eliminate or lessen adverse environmental damage
NEPA	National Environmental Policy Act of 1969, as amended
Old-growth timber	Timber of a forest from the late successional stage of forest development. The forest contains live and dead trees of various sizes, species, composition, and age class structure. The age and structure of old growth varies significantly by forest type and from one biogeoclimatic zone to another. Old growth timber is not an eligible commodity in this Bioenergy Program.
Preferred alternative	The alternative the FSA decisionmaker intends to select.
Proposal	Bioenergy Program FY 03-06
Quarter (1st, 2nd , 3rd, 4th)	The respective time periods of October 1 through December 31, January 1 through March 31, April 1 through June 30, and July 1 through September 30 of each Fiscal Year.
Selected alternative	The alternative that FSA decisionmaker has chosen to implement
Tier, Tiering	Refers to the coverage of general matters in a broadly scoped Environmental Impact Statement or Environmental Assessment, such as this Bioenergy Program Environmental Assessment. See CEQ Regulations § 1508.18 for a complete definition of tiering.

Term	Definition
USDA	United States Department of Agriculture

## Appendix B: Cost-Benefit Assessment

### COST-BENEFIT ASSESSMENT

Date: July 19, 2002

Agency: USDA/FSA

Contact: Pete Riley  
Feed Grains and Oilseeds Analysis Group  
Economic and Policy Analysis Staff  
Farm Service Agency  
United States Department of Agriculture  
Washington, DC 20250

Phone: 202-720-7787

I. TITLE. Bioenergy Program

II. NEED FOR ACTION.

The proposed rule for the Bioenergy Program (BP) would essentially clarify existing regulations and amend other regulations to bring them into compliance with changes made by the Farm Security and Rural Investment Act of 2002 (Bioenergy Program FY 03-06) as follows:

- Modifies the definition for biodiesel
- Extends BP beyond fiscal year (FY) 2002.
- Allows producers to enter into multi-year contracts for program payments.
- Expands the number of eligible commodities.
- Revises the payment calculations for eligible commodities.



Except for revision of the payment calculation, these issues are not subject to rigorous analysis because of their negligible impacts.

### **III. DISCUSSION.**

The Bioenergy Program (BP) has been continued for FYs 2003 through 2006 under section 9010 of the Bioenergy Program FY 03-06. Funding is authorized at \$150 million per year from the Commodity Credit Corporation (CCC). BP was first implemented during FY 2001 and funded for FY 2001 and FY 2002 at \$150 million each year. BP's goal is to expand industrial consumption of agricultural commodities by promoting their use in production of bioenergy. Great interest exists in promoting biobased fuels because they are renewable and promote U.S. energy security. Biobased fuels provide a boost to agricultural commodity producers by expanding markets and increasing prices.

Ethanol production has expanded dramatically in recent years in response to a number of factors, including clean air policies, Federal and State incentives, and higher petroleum prices that make ethanol more competitive for blending. One of the most critical factors underlying the ethanol industry's current growth is the planned ban on the use of methyl tertiary butyl ether (MTBE) in California and 17 other States. MTBE is a competing oxygenate that has polluted groundwater in several areas. This ban will enlarge the market for ethanol and has already sparked a major expansion of ethanol production capacity from both new and existing plants. According to the Renewable Fuels Association, 12 ethanol plants are now under construction. When completed, they will raise total U.S. capacity to 2.8 billion gallons, up from 1.8 billion in 2000.

Biodiesel production remains limited, primarily, to experimental and test fleet applications. Unlike ethanol, no mandate exists to drive large-scale use and it is not yet cost competitive. Demand for biodiesel as a lubricity agent in diesel fuel could increase significantly, however, by 2007 when diesel fuel will be required to reduce sulfur content. As biodiesel production expands and the range of feedstocks widens, costs should start to decline. Production increases could also start to spur development of the infrastructure to transport and handle biodiesel inputs and products.

BP is not expected to have appreciable impact on total ethanol production, which is already large and expanding rapidly. However, BP provides support for individual firms, facilitating the increase in capacity. For biodiesel, which is at an earlier stage of development, the BP's impact could be greater. The Office of Energy Policy and New Uses (OEPNU) estimated total biodiesel production was 1-2 million gallons per year prior to BP. OEPNU estimated 2001 production climbed to 10 million gallons, mainly in response to BP incentives. Biodiesel producers received bioenergy payments on 8.6 million gallons in 2001.

BP provides cash payments to bioenergy (ethanol and biodiesel) producers who increase their bioenergy production from eligible commodities compared to the previous FY. Eligible producers can receive up to \$7.5 million per year in payments. BP offers producers from smaller plants more favorable payment rates, resulting in higher subsidy rates, to encourage their participation. This is explained below.

For ethanol producers, payments are made as follows. The increase in eligible gallons of ethanol produced is divided by the conversion factor (e.g., 2.5 gallons per bushel for corn). This bushel equivalent figure (or gross payment units) is then divided by the payment rate that is differentiated by plant size (2.5 for plants with total annual production capacity of less than 65 million gallons and 3.5 for plants over this threshold). Finally, the resulting payment bushels (or net payment units) are multiplied by a commodity price to generate the actual payment. FSA uses a market price that applies for the FY quarter when the increase in ethanol was produced. Here is an example for an ethanol production increase of 1,000 gallons from corn by a producer who produces less than 65 million gallons annually. The applicable corn price is \$2.00 per bushel.  $(1,000 / 2.5) = 400 / 2.5 = 160 * \$2.00 = \$320.00$ .

For biodiesel producers, the procedure is similar, except that the conversion factor is defined in terms of feedstock units per gallon instead of gallons per feedstock unit. Thus, the increase in eligible gallons of biodiesel produced is multiplied by the conversion factor (e.g., 7.7 pounds of animal fats and oils per gallon). This figure (or gross payment units) is then divided by the payment rate (differentiated by plant size) of 2.5 or 3.5. Finally, the resulting payment quantity (or net payment units) is multiplied by the prevailing commodity price for that quarter to generate the actual payment. Here is an example for a biodiesel production increase of 1,000 gallons from soybean oil by a producer who produces less than 65 million gallons annually. The applicable soy oil price is \$0.165 per bushel.  $(1,000 * 7.7) = 7,700 / 2.5 = 3,080 * \$0.165 = \$508.20$ .

Prior to the continuation of BP under the Bioenergy Program FY 03-06, animal fats and oils were added to the list of eligible commodities from the original list of grains, oilseeds, and cellulosic crops such as switchgrass and short rotation trees grown for the purpose of producing ethanol or biodiesel. (Not all commodities in the program are eligible for marketing assistance loans.) The Bioenergy Program FY 03-06 added cottonseed as an eligible commodity, along with any animal byproducts such as whey (in addition to oils, fats, and greases) that may be used to produce bioenergy.

BP payments have been well under the annual funding levels so far. In FY 2001, payments totaled \$40.7 million; for the first two quarters of FY 2002, \$32 million. To date, corn has dominated the commodities receiving bioenergy payments for ethanol. There have also been payments for grain sorghum, and a very small amount for wheat. For biodiesel, soybeans have dominated the actual payments made, while animal fats and oils received a small amount recently (See Tables 2 and 3).

#### IV. STATUTORY AUTHORITY.

Section 9010 of the Bioenergy Program FY 03-06 provides BP's statutory authority. BP is codified under Part 1424 of title 7, Code of Federal Regulation, "under which the Secretary makes payments to eligible producers to encourage increased purchases of eligible commodities for the purpose of expanding production of such bioenergy and supporting new production capacity for such bioenergy." BP was initially started under authority of the CCC Charter Act which authorizes CCC to use its general powers to "increase domestic consumption of agricultural commodities by expanding or aiding in the expansion of domestic markets for agricultural commodities."

#### V. OPTIONS CONSIDERED AND ASSOCIATED IMPACTS.

A. Modifying the definition for biodiesel

The Bioenergy Program FY 03-06 requires that the definition be modified as follows: Biodiesel is a mono alkyl ester manufactured in the United States that meets requirements of an appropriate American Society for Testing and Materials (ASTM) Standard. Up to 2002, no standard existed. ASTM developed the biodiesel standard in 2002. ASTM standards are voluntary consensus standards developed through participation of all interested stakeholders. It is impossible to measure a specific economic impact of this change, but like any standard, it will promote understanding of the product and ensure compatibility among producers, users, and government officials involved in BP. Development of a biodiesel standard will facilitate growth of the industry. Because the Bioenergy Program FY 03-06 required this change and there are no quantitative impacts, no other options are considered.

B. Extending BP beyond FY 2002.

The original BP was only funded for two years. Extending it another four years will enlarge the pool of potential beneficiaries, including new plants that have not yet come on stream or that are still being planned. BP might be a determining factor at the margin for some investors and/or bankers in making funding decisions for new plants. In addition, existing plants that may be considering expansion could benefit. The additional cost is a maximum of \$600 million–\$150 million per year. Without the legislation, this government support would not be available for encouraging the use of agricultural commodities for bioenergy production. The funding may impact only those plant investments at the margin. This proposed change would simply bring the current regulations into conformity with the Bioenergy Program FY 03-06. Thus, no other options are considered.

C. Allowing producers to enter into multi-year contracts for program payments.

Up to now, bioenergy producers have been required to submit agreements for one year at a time during a designated sign-up period. Allowing multi-year contracts should benefit producers who can enlarge their planning horizons. It would be particularly helpful for facilitating new construction or expansion that may not be completed within the initial program year. This would increase incentives to invest in a new or expanded facility by providing additional funding over a longer period. Producers may still enter into a contract for one year if they choose. This proposed change would simply bring current regulations into conformity with the Bioenergy Program FY 03-06. Thus, no other options are considered.

D. Expanding the list of eligible commodities.

The list of eligible commodities is expanded to include cottonseed and any animal byproduct (in addition to oils, fats, and greases) that may be used to produce bioenergy. Because BP so far has made payments on only a limited number of commodities (corn, grain sorghum, wheat, soybeans, and animal fats and oils), it is difficult to forecast what payments, if any, will be made on the newly eligible commodities. Assuming that some of the new commodities do enter BP, the volume is likely

to be small. Thus, the price impacts would be negligible. For corn and soybeans, the two dominant BP crops to date, price impacts have been estimated at less than one cent per bushel.

Expansion of commodities does widen potential for agricultural producers who did not produce eligible commodities in the past to participate. Furthermore, the Bioenergy Program FY 03-06 lengthens BP's time span, thus raising the potential for cellulosic crops, assuming future technological improvements will make them more efficient as bioenergy feedstocks. Some Texas producers have expressed interest in using cottonseed to produce biodiesel. In addition, some whey may be used in the program. Whey is an animal byproduct (from dairy) that can be used to make ethanol. Some cheese plants in California and Wisconsin currently produce ethanol from whey independently of BP. This proposed change would simply bring the current regulations into conformity with the Bioenergy Program FY 03-06. Thus, no other options are considered.

E. Revising the payment calculations for eligible commodities.

Option 1. Continue the conversion factor for all eligible fats and oils at 7.7 pounds of animal fats and oils per gallon of biodiesel and base payments on the soybean oil price (per pound) rather than on a soybean price (per bushel).

Option 2. Set conversion factors for each animal fat or oil separately and base payments on prices for each animal fat or oil.

The economic and outlay impacts associated with these options are summarized below.

Revising the biodiesel payment calculations for eligible animal fats and oils.

Option 1.

The corn conversion factor used for ethanol of 2.5 gallons per bushel was spelled out in Part 1424 definitions (Sec. 1424.3) and is not changed here. BP included animal fats and oils in 2002. The conversion factor of 7.7 pounds of animal fats and oils per gallon of biodiesel will continue to be used. No change in outlays is associated.

Switching payments from a soybean basis to soybean oil basis will save around \$0.75 per gallon on biodiesel payments, based on current prices. The extent of savings will depend on the market prices used at the time of the payment. However, this would also reduce producer incentives. This change should rectify the problem of paying producers subsidies based on the total value of soybeans when only a small share of the soybean value comes from its oil. Biodiesel producers can buy soy oil to use as a biodiesel feedstock substantially cheaper than the total cost of the soybeans crushed to make the oil in the first place. Much of the soybean's value comes from its protein meal, the co-product created with oil. (This contrasts with the situation for corn used for ethanol. Starch, the component in corn processed into ethanol, comprises over 50 percent of corn and provides the principal value more than its co-products.)

The reduction in outlays could be considerable. Assume all biodiesel producers have annual bioenergy production of less than 65 million gallons. If all biodiesel payments made in the first two quarters of FY 2002 for soybeans were instead calculated on soybean oil, the conversion would have reduced outlays by \$3.1 million in aggregate for this period. This assumes the same quantity of biodiesel was produced at the lower payment rate. The outlay reductions would be lower if less biodiesel were produced because of lower incentives (discussed below). The aggregate outlay reductions could also be less if more biodiesel was produced, albeit at a lower rate per unit.

The change in the payment calculation would reduce the per unit rate to producers by the same amount government reduces outlays. Thus, producers would have received \$3.1 million less in payments for the first half of FY 2002, assuming the payment calculation change applied to all biodiesel produced. Lower incentives to produce biodiesel could lower overall production under BP, but the likely overall impact is negligible.

#### Option 2.

Although alternatives to Option 1 are not very practical, Option 2 considers setting individual conversion factors for each animal fat or oil, rather than using soybean oil as the standard conversion factor, and then bases payments on prices for each animal fat or oil. This could prove very difficult for most animal fats and greases. Actual grease content is not always known, because grease may contain a blend of fats from different animals and may also contain various oils recovered from fast food deep fat fryers and other sources. Thus, there would be no precise way of knowing the accuracy of the conversion factors. Furthermore, aside from yellow and white grease, price data are limited, at best. Although standard conversion factors for each type of oil are available, price data are not readily available for all oils. Because soybean oil is the dominant oil produced and used in the United States, it serves as the main reference point for oil markets. Any use of less transparent and less uniform conversion factors and payment calculations could raise costs, to either the government or to producers, to the extent that resulting payment calculations are not accurate. Thus, Option 1 was selected.

## V. SUMMARY

BP funding is authorized at \$150 million per year from the Commodity Credit Corporation (CCC) for FY 2003 through 2006; thus, the additional cost from this change is a maximum of \$600 million. The program was first implemented during FY 2001 and funded for FY 2001 and FY 2002 at \$150 million each year. Payments have been well under the annual funding levels--FY 2001 payments totaled \$40.7 million, and for the first half of FY 2002 they were \$32 million. The list of eligible commodities is expanded to include cottonseed and any animal byproduct (in addition to oils, fats, and greases) that may be used to produce bioenergy. However, because payments have been made on only corn, grain sorghum, wheat, soybeans, and animal fats and oils, it is difficult to forecast additional payments on the newly eligible commodities. Assuming that some of the new commodities do enter the program, the volume is likely to be small, and the outlay effects negligible. Thus, the cost of the program is expected to remain close to what it has been

recently, and the number of participants receiving payments are expected to increase only slightly. Revising the payment calculations for biodiesel from a soybean basis to soybean oil basis will reduce the payment rate and thus reduce outlays on biodiesel payments. Soybeans have been the predominant commodity for biodiesel payments to date. If all biodiesel payments made in the first two quarters of FY 2002 for soybeans were instead calculated on soybean oil, the conversion would have reduced outlays \$3.1 million--about 60 percent--for this period. Future changes in outlays will depend on the prevailing market prices and the volume of participation. The switch to a soybean oil payment basis will reduce producer incentives and likely participation, and the expansion in eligible commodities is only expected to provide a partial offset.

## Appendix C: Bioenergy Production Facilities & Capabilities

**Table C.1 Ethanol Production Facilities and Capacities**

Company	Location	Feedstock	Capacity (million gallons per year)
ACE Ethanol	Stanley, WI	Corn	15
Adkins Energy, LLC*^	Lena, IL	Corn	40
A.E. Staley	Loudon, TN	Corn	60
AGP*	Hastings, NE	Corn	52
Agra Resources Coop (Exol)*	Albert Lea, MN	Corn	37
Agri-Energy, LLC*	Luverne, MN	Corn	21
Alchem Ltd. LLLP	Grafton, ND	Corn	10.5
Al-Corn Clean Fuel*	Claremont, MN	Corn	18
Archer Daniels Midland	Decatur, IL Peoria, IL Cedar Rapids, IA Clinton, IA Walthalla, ND	Corn Corn Corn Corn Corn/barley	950
Badger State Ethanol, LLC*^	Monroe, WI	Corn	40
Broin Companies	Scotland, SD	Corn	9
Cargill, Inc.	Blair, NE Eddyville, IA	Corn Corn	75 35
Central MN Ethanol Coop*	Little Falls, MN	Corn	19
Chief Ethanol	Hastings, NE	Corn	62
Chippewa Valley Ethanol Co.*	Benson, MN	Corn	21
Corn Plus*	Winnebago, MN	Corn	44
Dakota Ethanol, LLC*	Wentworth, SD	Corn	45
DENCO, LLC*	Morris, MN	Corn	20
ESE Alcohol Inc.	Leoti, KS	Seed corn	1.5
Ethanol2000, LLP*	Bingham Lake, MN	Corn	30
Glacial Lakes Energy, LLC*^	Watertown, SD	Corn	40
Golden Cheese Company of California*	Corona, CA	Cheese whey	5
Golden Triangle Energy, LLC*	Craig, MO	Corn	20
Gopher State Ethanol	St. Paul, MN	Corn	15
Grain Processing Corp.	Muscataine, IA	Corn	10
Great Plains Ethanol, LLC*^	Chancellor, SD	Corn	40

Company	Location	Feedstock	Capacity (million gallons per year)
Heartland Corn Products*	Winthrop, MN	Corn	35
Heartland Grain Fuels, LP*	Aberdeen, SD	Corn	8
	Huron, SD	Corn	14
High Plains Corp.	York, NE	Corn/milo	50
	Colwich, KS		20
	Portales, NM		15
Husker Ag Processing*^	Plainview, NE	Corn	20
James Valley Ethanol, LLC^	Groton, SD	Corn	45
J.R. Simplot	Caldwell, ID	Potato waste	6
	Burley, ID		
Land O' Lakes*	Melrose, MN	Cheese whey	2.6
Little Sioux Corn Processors, LLC*^	Marcus, IA	Corn	40
Manildra Energy Corp.	Hamburg, IA	Corn/milo/wheat starch	8
Merrick/Coors	Golden, CO	Waste beer	1.5
Michigan Ethanol, LLC^	Caro, MI	Corn	40
Midwest Grain	Pekin, IL	Corn/wheat starch	78
	Atchison, KS		
Midwest Grain Processors*^	Lakota, IA	Corn	45
Miller Brewing Co.	Olympia, WA	Brewery waste	0.7
Minnesota Corn Processors*	Columbus, NE	Corn	100
	Marshall, MN	Corn	40
Minnesota Energy*	Buffalo Lake, MN	Corn	18
New Energy Corp.	South Bend, IN	Corn	85
Northeast Iowa Ethanol, LLC*^	Earlville, IA	Corn	15
Northeast MO Grain Processors*	Macon, MO	Corn	21
Northern Lights Ethanol, LLC*	Big Stone City, SD	Corn	40
Permeate Refining	Hopkinton, IA	Sugars & Starches	1.5
Pine Lake Corn Processors, LLC*^	Steamboat Rock, IA	Corn	15
Plover Ethanol	Plover, WI	Seed corn	4
Pro-Corn, LLC*	Preston, MN	Corn	22
Quad-County Corn Processors*	Galva, IA	Corn	18
Reeve Agri-Energy	Garden City, KS	Corn/milo	12
Siouxland Energy & Livestock Coop*	Sioux Center, IA	Corn	14
Spring Green Ethanol^	Spring Green, WI	Cheese whey	0.7
Sunrise Energy*	Blairtown, IA	Corn	7



Company	Location	Feedstock	Capacity (million gallons per year)
Sutherland Associates	Sutherland, NE	Corn	15
Tall Corn Ethanol, LLC*^	Coon Rapids, IA	Corn	40
Tri-State Ethanol Co., LLC*	Rosholt, SD	Corn	40
U.S. Energy Partners, LLC	Russell, KS	Milo	25
U.S. Liquids	Louisville, KY Bartow, FL R. Cucamonga, CA	Beverage waste	4 4 4
Williams Bio-Energy	Pekin, IL Aurora, NE	Corn Corn	100 35
Wyoming Ethanol	Torrington, WY	Corn	5
Total Capacity			2823.00

\* farmer-owned

^ under construction

*Source: Renewable Fuels Association*

**Table C.2 Ethanol Bioenergy Payments to Date (FY 2001 and FY2002 1/)**

Commodity	Gallons of subsidized production	Payments	Payment rate
Corn	233,035,238	\$56,592,022	\$0.24
Grain Sorghum	10,384,661	\$2,759,122	\$0.27
Wheat	681,564	\$285,053	\$0.42
Total	244,101,463	\$59,636,197	\$0.24

*1/ Through first 2 quarters of FY2002.*

**Table C.3 Biodiesel Bioenergy Payments to Date (FY 2001 and FY2002 1/)**

Commodity	Gallons of subsidized production	Payments	Payment rate
Soybeans	10,474,570	\$13,033,788	\$1.24
Animal Fats and Oils	34,616	\$8,753	\$0.25
Total	10,509,186	\$13,042,541	\$1.24

*1/ Through first 2 quarters of FY2002.*

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